

Aero Design Ltd.**Work Order Control Sheet**Work Order#: 2016-78 Date Opened: 20 May 2016 Title: FabricationAircraft OEM: Bell Aircraft Model: 206B Product Type: Beams Product Model: Standard Quantity: 1 Fwd / 1 Aft**Work Order Contents**

Work Order/Build Sheets (Procedures Provided)
Additional Work Sheets (Standard Practice)
Drawings (See List Below)
Parts Distribution Sheet
Sub Component Tags
Completed Certification (Original)
Time Sheet (R&D)
Notes

Initial or N/A

JC
N/A
JC
JC
N/A
N/A
N/A
N/A

Build Sheet Contents

Tasks Initialled
Dual Inspections Initialled

JC
JC

Drawing List

Drawing #	Rev #	Description	Initial or N/A
49730	1	Forward Beam	JC
49731	0	Aft Beam	JC

Component Completion

Quantity Complete on This Work Order
Quantity Incomplete on This Work Order
Further Processing Required Before Release
Release to Stock as Components

As Instructed

1 / 1
N/A
N/A
N/A

Certification

Form One Completed
Serviceable (Green) Tag Completed
In Process (Yellow) Tag Completed
Unserviceable (Red) Tag Completed
Parts Tracking Tags (White) Completed
Parts Placed in Stores for Distribution

Initial or N/A

JC
N/A
N/A
N/A
N/A
N/A
N/A

Additional Documentation

Documentation of a minor change
Non-Conformance Report Required
Service Difficulty Report Required

Initial or N/A

N/A
N/A
N/A

Billing

Local (Aero Design)
Research and Development
Third Party

JC
N/A
N/A

Traveller

Work performed by:

Print: D. Bartfai

ICC / Dual Inspection performed by:

Print: J. Clarke

Work Order closed by:

Print: J. Clarke

Approved Manufacturing Facility 73-04

Sign:

Sign:

Sign:

Form 20.D.03

SCA: AD07

SCA: AD02

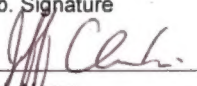
SCA: AD02

Date: 20-May-16

Date: 26-May-16

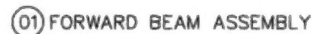
Date: 26-May-16

Rev. Original 23 Sep 2014

1. Approving Civil Aviation Authority/Country Transport Canada		2. AUTHORIZED RELEASE CERTIFICATE FORM ONE			3. Form Tracking No. 2016-0070
4. Organization Name and Address AERO Design Ltd. – 9888A Malaspina Road, Powell River, BC, V8A 0G3					5. Work Order/Contract/Invoice WO 2016-78
6. Item	7. Description	8. Part Number	9. Qty.	10. Serial/Batch No.	11. Status/Work
1.	Forward Beam	49730-01	1	N/A	New
2.	Aft Beam	49731-01	1		
12. Remarks					
13a. Certifies that the items identified above were manufactured in conformity to: <input checked="" type="checkbox"/> Approved design data and are in condition for safe operation. <input type="checkbox"/> Non approved design data specified in block 12.			14a. <input type="checkbox"/> CAR 571.10 Maintenance Release <input type="checkbox"/> Other regulation specified in block 12. Certifies that unless otherwise specified in block 12, the work identified in block 11 and described in block 12, has been performed in compliance with the Canadian Aviation Regulations.		
13b. Signature  AD 73-04 02		13c. Approved Organization Number AMF 73-04		14b. Signature	
13d. Name Jeff Clarke - AD02		13e. Date (dd/mmm/yyyy) 26 May 2016		14c. Approved Organization Number	
				14d. Name	
				14e. Date (dd/mmm/yyyy)	
Installer Responsibilities					
<p>This certificate does not constitute authority to install.</p> <p>Installers working in accordance with the national regulations of a country other than that specified in block 1 must ensure that their regulations recognize certifications from the country specified.</p> <p>Statements in blocks 13a or 14a do not constitute installation certification. In all cases, the technical record for the aircraft must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.</p>					

GREAT SLAVE

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	DOWN TUBE LOCATION CHANGED	BUC	OCT 09/00

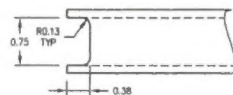
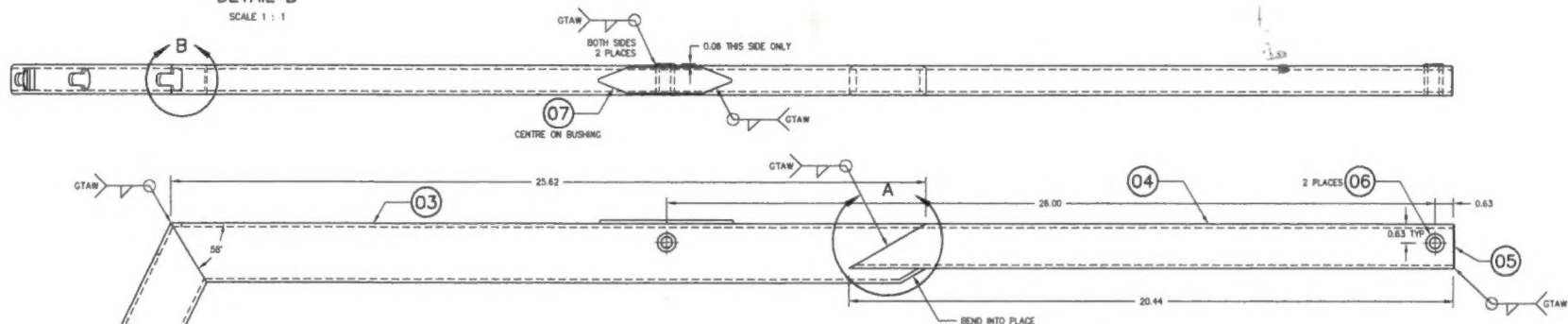


1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C.
WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT FOR STAINLESS STEEL.
3. ALL STEEL PARTS TO BE THOROUGHLY DEGREASED AND POWDER COATED PRIOR TO INSTALLATION.

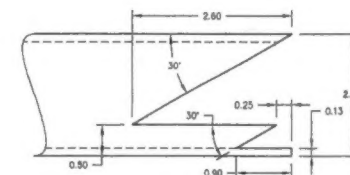
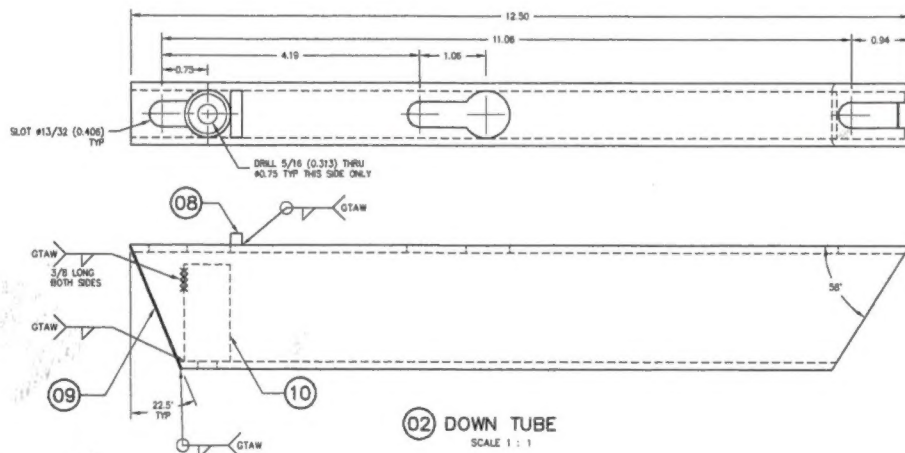


1	MS1044C3	NUT				
	#10 - 32	C/SUN SCREW	STAINLESS STEEL	COMMERCIAL	15mm X 70mm SPRING	
	19830-23	13 SPRING		COMMERCIAL		#0.75 ROD
	19830-22	12 KNOB	6061-T6 ALUMINUM	QQ-A-200/B		#0.625 ROD
	19830-21	11 ST/CP	6061-T6 ALUMINUM	QQ-A-200/B		#0.625 ROD
	19830-11	10 GUIDE	304 STAINLESS STEEL	ASTM A269		#0.75 X 0.065 RND. TL
	19830-20	09 CAP	321 STAINLESS COND. A	AMS 5510		0.025 SHEET
	19830-19	08 CAP	321 STAINLESS COND. A	AMS 5510		0.025 SHEET
	19830-07	07 B LOCK	304 STAINLESS STEEL	ASTM A479		0.25 X 0.125 RND
	19830-16	06 STRAP	304 STAINLESS STEEL	MIL-S-3059		0.100 SHEET
2	19830-15	05 BUSHING	304 STAINLESS STEEL	ASTM A213		#0.625 X 0.120 TUBE
	19830-04	04 CAP	321 STAINLESS COND. A	AMS 5510		0.025 SHEET
	19830-03	03 TUBE	304 STAINLESS STEEL	ASTM A554		2 X 1 X 0.12 TUBE
	19830-02	02 DOWN TUBE	304 STAINLESS STEEL	ASTM A554		2 X 1 X 0.12 TUBE
	19730-01	01 FORWARD BEAM ASSEMBLY				
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY				LIST OF MATERIALS		
APPROVALS			DATE			
DRAWN: JEFF CLARKE			01 OCT 2008			
CHECKED: E. BURGIN						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:			BELL 206B QUICK RELEASE MOUNTING PROVISIONS FORWARD BEAM FABRICATION			
DIMX XXX ±0.010 XX ±0.03 X ±0.1		ANGLES ±1/2°		SCALE: 1 OF 1 SHEET 1 OF 2		
				A1 49730 1		
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DNR 2300M 2013 - 59TH AVENUE N.E., SAGINAY, ALBERTA, CANADA, T6E 6B7 Tel: (403) 260-8007 Fax: (403) 260-3883 www.aerobridge.ca						

2016-78

DETAIL B
SCALE 1 : 1

01 AFT BEAM ASSEMBLY

DETAIL A
SCALE 1 : 102 DOWN TUBE
SCALE 1 : 1

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF STEEL TO BE COMPLETED BY GTAW METHOD TO AWS288SC. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT FOR STAINLESS STEEL.
3. ALL STEEL PARTS TO BE THOROUGHLY DEGREASED AND POWDER COATED PRIOR TO INSTALLATION.

QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	MS21044C3	NUT		STAINLESS STEEL	COMMERCIAL	
1	#10-32	C'SUNK SCREW		STAINLESS STEEL	COMMERCIAL	15mm X 70mm SPRING
1	60830-23	13 SPRING		6081-T6 ALUMINUM	60-A-200/23	#0.75 ROD
1	60830-22	12 PINCH		6081-T6 ALUMINUM	60-A-200/28	#0.625 ROD
1	60830-21	11 STOP		304 STAINLESS STEEL	ASTM A286	#0.75 X 0.063 RND. TUBE
1	60830-11	10 GUIDE		321 STAINLESS COND. A	AMS 5510	0.025 SHEET
1	60830-19	09 CAP		304 STAINLESS STEEL	ASTM A479	0.188 SCH. 40S
1	60830-07	08 BLOCK		304 STAINLESS STEEL	MIL-S-5039	0.100 SHEET
1	60830-18	07 STRAP		304 STAINLESS STEEL	ASTM A213	#0.625 X 0.120 TUBE
2	60830-15	06 BUSHING		321 STAINLESS COND. A	AMS 5510	0.025 SHEET
1	49731-05	05 CAP		304 STAINLESS STEEL	ASTM A554	1.5 X 1 X 0.12 TUBE
1	49731-04	04 TUBE		304 STAINLESS STEEL	ASTM A554	2 X 1 X 0.12 TUBE
1	49731-03	03 TUBE		304 STAINLESS STEEL	ASTM A554	2 X 1 X 0.12 TUBE
1	49731-02	02 DOWN TUBE		304 STAINLESS STEEL	ASTM A554	2 X 1 X 0.12 TUBE
1	49731-01	01 AFT BEAM ASSEMBLY				

QTY	LIST OF MATERIALS			
APPROVALS		DATE		
DRAWN:	JEFF CLARKE	01 OCT 2008		
CHECKED:	E. BURDON			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		COMBULSING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 2001 2013 - 38TH AVENUE N.E., CALGARY, ALBERTA, CANADA. T5S 6S7 tel: (403) 850-8037 fax: (403) 250-8333 www.aerodesign.ca		
DECIMALS		BELL 206B		
ANGLES		QUICK RELEASE MOUNTING PROVISIONS		
X.XXX ±0.010	±1/2'	AFT BEAM FABRICATION		
X.XX ±0.03		SCALE 1 : 2		
X.X ±0.1		Dwg. No.		
SHEET 1 OF 1		REV.		
A1		49731		
		0		

AERO DESIGN LTD.
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 280M
2015 - 50TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2C 6K7
Tel: (403) 850-8887 Fax: (403) 850-8883 www.aerodesign.ca

MOUNTING BEAM FABRICATION – 49730/49731

General

These instructions apply to mounting beams 49730-01 (forward) and 49731-01 (aft) for Bell 206B low mounted cargo baskets. Refer to the following drawings, at the current revision, for dimensions and details:

49730, Revision 1 – Forward Beam

49731, Revision 0 – Aft Beam

Work Order: 2016-78

Batch Quantity: 1 FWD
1 AFT

Date Open: 20 MAY 2016

Complete (initial or SCA #)	
FWD	AFT
AD	AD
73-04	73-04
07	02

1. Beam Fabrication

- Cut 1 x 2 x 0.12 material as indicated on drawings.
 - 49730-01: 49730-03 (long tube), 49730-02 (down tube)
 - 49731-01: 49731-03 (long tube), 49731-02 (down tube) *X*
- Cut 1 x 1.5 x 0.12 material as indicated on drawings.
 - 49731-01: 49731-04 (far side tube)
- Record material PO on attached material list.
- De-burr cut ends using a sanding disc on a die-grinder.
- Remove writing on tubes with acetone.
- Tag in-progress parts and place on in-progress shelf in machine shop for CNC machining of keyways, slots, and bushing holes.

2. Beam Fabrication - 49731-03 Long Tube

The interface cuts are critical to minimize deflection during welding. Use the full scale template to layout cuts. Ensure correct orientation of tubes before cutting.

- Mark straight cut ends as indicated on template, 0.9" and 2.6" from end.
- Set vertical bandsaw guide to cut along bottom wall of tube, 0.13 from bottom edge. Hold tube tight against guide through cut. Cut to 0.9" mark.

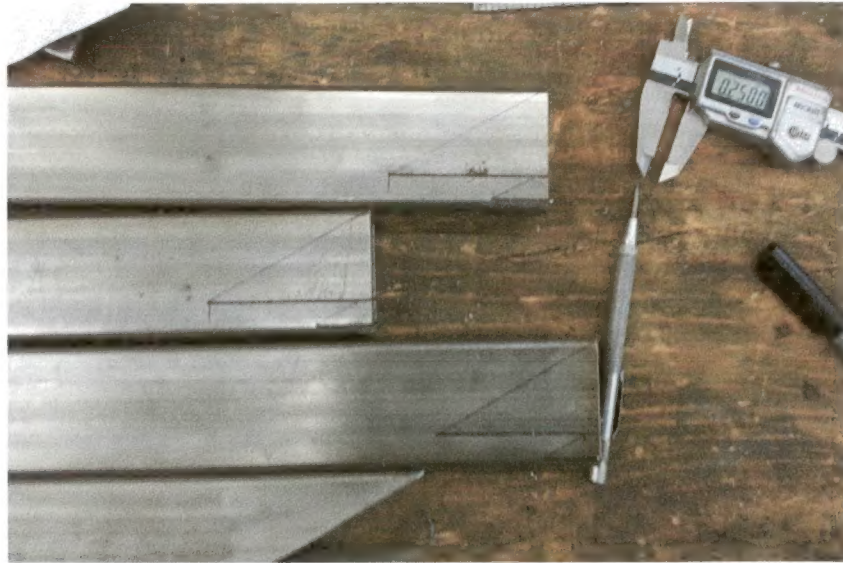


- Set vertical bandsaw guide to cut along 1.5" from top edge. Ensure 49731-04 tube will seat tightly into cutout. Hold tube tight against guide through cut. Cut to 2.6" mark.

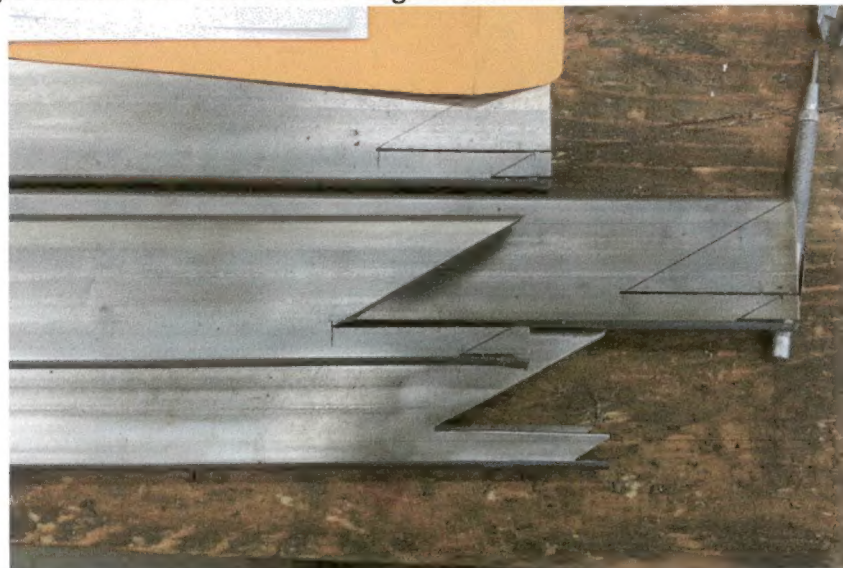


- d. The small tab between the cuts will be sprung out. Squeeze in to ensure tube will sit flat.
- e. Using tube 49731-04 as a guide, layout cut angle to ensure tight fit.

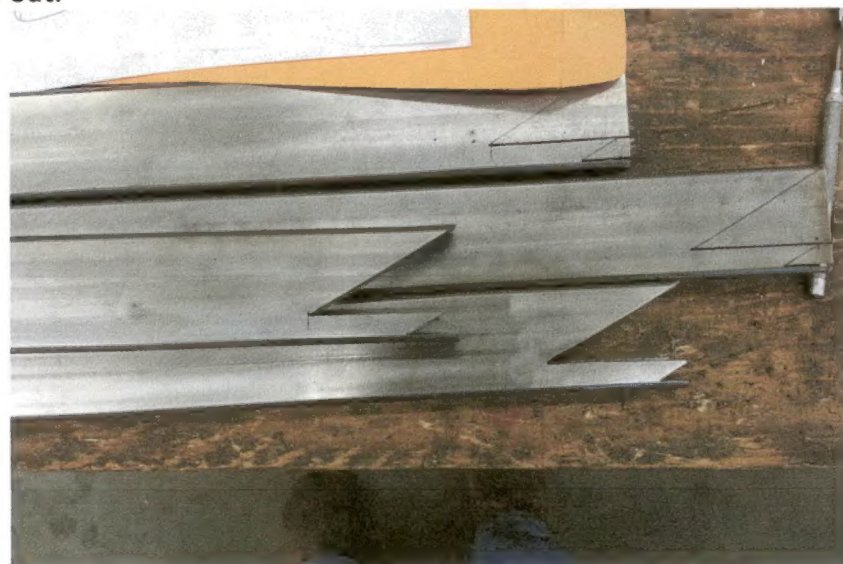




- f. Cut large angle section out. Start cut on edge of end face.



- g. Cut small tab out.



- h. Deburr all cut edges. Tag in-progress parts and place on in-progress shelf in welding shop.

(initial or SCA #)

FWD
 73-04
 07

AFT
 73-04
 07

3. Beam Fabrication – Components

Note: Some components are used for many different beams and are made in batches on separate component work orders. Check stock before making components.

- Shear and bend caps: 69830-19, 69830-20, 49730-04, 49731-05.
- Cut and turn 69830-15 bushings and 69830-11 guide tubes:
 - Cut stock to length + 0.03-0.06".
 - Face one end flat @ 1000 RPM.
 - De-burr outside with a file and inside with de-burring tool at 300 RPM.
 - Setup stop and face other end to length @ 1000 RPM.
 - De-burr outside with a file and inside with a de-burring tool at 300 RPM.
- Cut 69830-07 blocks.
- Record component POs / WOs on attached material list.

PD
 73-04
 02

PD
 73-04
 02

4. CNC Machining

- Run CNC programs to machine keyways, slots and holes in component parts.
 - 49720 – Forward beam bushing holes
 - 69805 – Forward and Aft Downtubes – Vertical Slots *Fwd + aft JC.*
 - 69804 – Aft beam end slot *JC.*
- De-burr keyways, slots and holes.
- Tag in-progress parts and place on in-progress shelf in welding shop for welding.

PD
 73-04
 05

5. Beam Welding – 49731-03 / 49732-04 Tubes

- TIG weld 49731-03 Tube and 49731-04 Tube together at scarf joint using ER308L rod.
- Record component and welding rod POs / WOs on attached material list.
- Tag in-progress parts for straightening.

N/A

PD
 73-04
 07

6. Beam Straightening – 49731-03 / 49731-04 Tubes

Note: straightening the beams is critical for ease of installation of the mounting beam and cargo basket.

- Straighten beams at scarf joint using hydraulic press.
 - Set beam upside down on blocks as far apart as possible, locate ram over scarf joint.
 - Use a block to distribute press loads, min 2" wide
 - Gradually work up to pressure required to make beam straight. The same pressure generally works for beams from the same batch.
 - Check for straight with a straight edge on top of tube. Ensure straight edge does not sit up on weld.

N/A

PD
 73-04
 02

7. CNC Machining

- Run CNC programs to machine keyways, slots and holes in component parts.
 - 49721 – Aft beam bushing holes
- De-burr keyways, slots and holes.
- Tag in-progress parts and place on in-progress shelf in welding shop for welding.

N/A

FWD AFT
AD Complete
73-04 Initial or SCA #)
05 N/A

8. Beam Welding – 49730-01 Forward Beam

- a. TIG weld 69830-11 guide tube into 49730-02 down tube using ER308L rod. Use jig to align guide tube to keyway and hole.
- b. TIG weld 69830-15 bushings into 49730-03 tube using ER308L rod, two places per tube, both sides. Ensure bushings protrude from correct side of beam. Refer to drawings.
- c. TIG weld 49730-03 long tubes (from b) to 49730-02 down tubes (from a) using ER308L rod. Use jig to hold tubes at correct angle.
- d. TIG weld components using ER308L rod:
 - i. 69830-16 strap to beam, centre on bushing, both beams.
 - ii. 69830-07 stop over bottom keyway on forward beam.
 - iii. 69830-19, 69830-20, 49730-04 caps. Ensure top slot on forward beam has sufficient clearance for basket fitting (96710-01 or Ancra 40088-14).
- e. Record component and welding rod POs / WOs on attached material list.
- f. Tag in-progress parts for finishing.

9. Beam Welding – 49731-01 Aft Beam

- a. TIG weld 69830-11 guide tube into 49731-02 down tube using ER308L rod. Use jig to align guide tube to keyway and hole.
- b. TIG weld 69830-15 bushings into 49731-03/-04 tubes (from step 7.) using ER308L rod, two places per tube, both sides. Ensure bushings protrude from correct side of beam. Refer to drawings.
- c. TIG weld 49731-03/-04 long tubes (from b) to 49731-02 down tube using ER308L rod. Use jig to hold tubes at correct angle.
- d. TIG weld components using ER308L rod:
 - i. 69830-16 strap to beam, centre on bushing, both beams.
 - ii. 69830-19, 49731-05 caps.
- e. Record component and welding rod POs / WOs on attached material list.
- f. Tag in-progress parts for finishing.

10. Beam Finishing

Note: straightening the beams is critical for ease of installation of the cargo basket.

- a. Straighten beams at strap using hydraulic press.
 - i. Set beam upside down on blocks as far apart as possible, locate ram over strap/bushing.
 - ii. Use a block to distribute press loads, about 2" wide
 - iii. Gradually work up to pressure required to make beam straight, usually more than 1000 psi is required. The same pressure generally works for beams from the same batch.
 - iv. Check for straight with a straight edge on bottom of tube. Ensure straight edge does not sit up on end cap.
- b. Straighten beams into plane using hydraulic press.
 - i. Check beams for plane by setting beam on a flat surface (welding table) on blocks. Use two blocks under long tube as far apart as possible. Attempt to slide block under end of down tube. Record direction and approximate distance to make block fit.
 - ii. Set beam on block under press ram, as close to corner at down tube as possible. Set the beam so that pushing down on the down tube will straighten the beam.
 - iii. Pressurize ram to 800 psi to hold beam.
 - iv. Clamp a snipe tube to down tube.

MOUNTING BEAM FABRICATION – 49730/49731

Complete
(initial or SCA #)

- v. Push down on snipe tube. Note pressure on press for applied deflection. Similar deflections will require similar pressure.
- vi. Check beams for plane, repeat steps ii-v if required.
- c. Break sharp edges off strap and stops using sanding disc on die-grinder.
- d. Tag in-progress parts for inspection.

FWD AFT

AD	AD
73-04	73-04
<u>02</u>	<u>02</u>

11. Final Inspection

To be completed by a different person than the previous steps.

- a. Inspect beams 49730-01 and 49731-01 for conformity to drawing.
- b. Tag in-progress parts ready for powder coating.

AD	AD
73-04	73-04
<u>07</u>	<u>07</u>

12. Powder Coating

- a. Parts are to be powder coated white in accordance with commercial practices.
- b. Record powder coating PO.
- c. Inspect powder coating on receiving.
- d. Tag in-progress parts ready for final assembly.

N/A - PAINTED

AD	AD
73-04	73-04
<u>07</u>	<u>07</u>

13. Final Assembly

To be completed after powder coating.

- a. Clear powder coat from stop pin hole with 5/16 (#4) centre drill.
- b. Install #10-32 x 3" countersunk screw, 69830-21 stop, and 69830-23 spring into bottom guide with 69830-22 knob and MS21044C3 nut. Check for function.
- c. Adhere P/N placard to top surface of beam, between strap and end on top surface.
- d. Green tag completed beam assemblies and place into stock.

Work Order: 2016-78Material Tracking Sheet
Bell 206B Forward Mounting Beams

1 of 1

Date Opened: 20 MAY 2016

Ass'y Step	Qty	Detail Drawing	Part Number	Description	Material	PO/WO
			49730-01	Fwd Beam Assembly		
Step 1				<i>Fabrication</i>		
	. 1		49730-02	Tube	304 Stainless, 2x1x0.12 tube	15039
	. 1		49730-03	Tube	304 Stainless, 2x1x0.12 tube	15039
Step 2				<i>Machining</i>	<i>None</i>	
Step 3				<i>Fabrication</i>		
	. 1		49730-04	Cap	321 Stainless, 0.025" Sheet	3021
	. 2		69830-15	Bushing	304 Stainless, 0.625x0.120 tube	15024
	. 1		69830-16	Strap	304 Stainless, 0.100" Sheet	15046
	. 1		69830-07	Block	304 Stainless, 0.25x0.125 Rod	15073
	. 1		69830-19	Cap	321 Stainless, 0.025" Sheet	3021
	. 1		69830-20	Cap	321 Stainless, 0.025" Sheet	3021
	. 1		69830-11	Guide	304 Stainless, 0.075x0.065 Rnd. Tube	2016-16
Step 4				<i>Welding</i>		
	A/R		--	Welding Rod	ER308L	14028
Step 5				<i>Straightening</i>	<i>None</i>	
Step 6				<i>Inspection</i>	<i>None</i>	
Step 7				<i>Powder Coating</i>		
Step 8				<i>Final Assembly</i>		
Step 8.b.	. 1		69830-21	Stop	6061-T6 Aluminum, 0.625 Rod	2016-18
	. 1		69830-22	Knob	6061-T6 Aluminum, 3/4" Rod	2016-61
	. 1		69830-23	Spring	15mm x 70 mm Spring	15071
	. 1		69830-1032X3	#10-32 x 3 Screw	Stainless Steel, Commercial	16016
	. 1		MS21044C3	Nut		13048
Step 8.c.	. 1		--	P/N Placard	TZ Tape, 1/2", black on white	

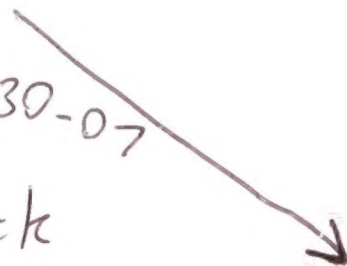
Cole

.25 should read
.125" ?

~~SA~~

69830-07

Block



Work Order: 216-78Material Tracking Sheet
Bell 206B Aft Mounting Beams

1 of 1

Date Open: 20 MAY 2016

Ass'y Step	Qty	Detail Drawing	Part Number	Description	Material	PO/WO
	<u>1</u>		49731-01	Aft Beam Assembly		
Step 1				<i>Fabrication</i>		
	. 1		49731-02	Tube	304 Stainless, 2x1x0.12 tube	15039
	. 1		49731-03	Tube	304 Stainless, 2x1x0.12 tube	15039
	. 1		49731-04	Tube	304 Stainless, 1.5x1x0.12 tube	8081
Step 2				<i>Machining</i>	None	
Step 3				<i>Fabrication</i>		
	. 1		49731-05	Cap	321 Stainless, Min 0.025 Sheet	3001
	. 2		69830-15	Bushing	304 Stainless, 0.625x0.120 tube	15024
	. 1		69830-16	Strap	304 Stainless, 0.100" Sheet	15046
	. 1		69830-07	Block	304 Stainless, 0.188 sqr. Rod	15073
	. 1		69830-19	Cap	321 Stainless, Min 0.025 Sheet	3021
	. 1		69830-11	Guide	304 Stainless, 0.75 x 0.065 rnd. Tube	8016-16
Step 4				<i>Welding</i>		
	. A/R		--	Welding Rod	ER308L	14028
Step 5				<i>Straightening</i>	None	
Step 6				<i>Inspection</i>	None	
Step 7				<i>Powder Coating</i>		
Step 8				<i>Final Assembly</i>		
Step 8.b.	. 1		69830-21	Stop	6061-T6 Aluminum, 0.625 Rod	2016-18
	. 1		69830-22	Knob	6061-T6 Aluminum, 3/4" Rod	2016-61
	. 1		69830-23	Spring	15mm x 70 mm Spring	15071
	. 1		69830-1032X3	#10-32 x 3 Screw	Stainless Steel, Commercial	16016
	. 1		MS21044C3	Nut		13048
Step 8.c.	. 1		--	P/N Placard	TZ Tape, 1/2"	